ARIZONA GAME AND FISH DEPARTMENT
HABITAT PARTNERSHIP PROGRAM
HABITAT ENHANCEMENT AND WILDLIFE MANAGEMENT PROPOSAL

PROJECT INFORMATION

Project Title: Nutritional Status & Winter Range Carrying Capacity for Mule Deer on the North Kaibab Plateau

Project No.

Region/GMU: 12A

HPC:

Project Type: Applied Research for Big Game Management

Project Description:

Past habitat management of the north Kaibab has been focused on summer range conditions and the ability of those ranges to meet the seasonal needs of the mule deer herd. Recent concerns have shifted to the adequacy of the winter range to meet the nutritional needs of the herd. Additionally, recent events such as the prolonged drought conditions and the impacts of wildfire on the winter range have heightened concerns not only of the nutritional status, but the capacity of the habitat to support an expanding population.

This project will utilize state of the art analytical methods and statistical designs to definitively determine dietary selection, forage nutritional quality and health status of mule deer on the North Kaibab winter range, and the adequacy of winter diets to meet the nutritional needs of the Kaibab mule deer herd.

In addition to the increasing the basic knowledge of how the Kaibab mule deer herd is utilizing the available habitat, the primary benefit from this project will be the development of recommendations that resource managers can use to enhance mule deer habitat on the North Kaibab Plateau and augment herd productivity. This will result in increased hunter opportunity and/or success.

Wildlife Species to Benefit: Kaibab Mule Deer (*Odocoileus hemionus*)

Possible Funding Partners:
Approved W-78-R Federal Aid Project
Arizona Deer Association

Implementation Schedule:
Beginning: Fall 2005
Completed: Dec. 2008

PROJECT FUNDING

SBG Funds Requested: $ up to $128,026.00

Cost Share Funds: $ 83,592.40 from ASU-East
30,000 from AGFD W78

Total Project Costs: $ 241,618

PARTICIPANT INFORMATION

Applicant: (please print) Dr. William Miller **Telephone: (480) 727-1288**	**Address:** **ASU Applied Biological Sciences** **c/o Office of Research & Sponsored Projects** **P.O.Box 873503, Tempe, AZ 85287-3503**
AGFD Contact and Phone No. **(If applicant is not AGFD personnel)**	**Chasa O'Brien, WMRS Branch Manager** **602-789-3247**
Coordinated with: FOR2; USFS, ADA	**Date:**
Applicant's signature:	**Date:**

SEND COMPLETED APPLICATIONS TO:
Game Branch
2221 W. Greenway Rd.
Phoenix, AZ 85023
mdisney@azgfd.gov

NEED STATEMENT/PROBLEM ANALYSIS:

The Kaibab mule deer (*Odocoileus hemionus*) herd has long been considered one of the premier mule deer herds in Arizona. A long held precept in wildlife habitat management is that given adequate water, cover, and space, the wellbeing of a wildlife population is directly proportional to the quality and quantity of forage resource available to the population. Furthermore, a wildlife population maintained on a high nutritional plain is more productive and less susceptible to mortality factors such as disease, environmental extremes and predation.

Past habitat management of the north Kaibab has been focused on summer range conditions and the ability of those ranges to meet the seasonal needs of the mule deer herd. Recently, concerns have shifted to winter range characteristics and the adequacy of the range to meet the nutritional needs of the herd. In the case of the Kaibab mule deer herd, the nutritional status of deer on the winter range is not clear. Additionally, recent events such as the prolonged drought conditions and the impacts of wildfire on the winter range have heightened concerns not only of the nutritional status, but the capacity of the habitat to support an expanding population.

This project will determine both the nutritional quality of the winter range diets and the nutritional health of the mule deer utilizing the North Kaibab winter range.

In addition to the increasing the basic knowledge of how the Kaibab mule deer herd is utilizing the available habitat, the primary benefit from this project will be the development of recommendations that resource managers can use to enhance mule deer habitat on the North Kaibab Plateau.

PROJECT OBJECTIVES:

The specific objectives of this project are fourfold:

1. To determine the dietary selection of mule deer on the north Kaibab winter range.

2. To evaluate the nutritional quality of the winter diets of mule deer on the winter range.

3. To evaluate the nutritional health of mule deer before and after winter range use using a number of physiological measurements of body conditions.

4. To evaluate the adequacy of winter diets to meet the nutritional needs of the Kaibab mule deer herd.

PROJECT STRATEGIES:

The following methodologies will be used to achieve the above listed objectives:

A total of 120 blood samples will be analyzed to determine the range of protein, energy and mineral parameters related to nutritional balance.
A total of 120 fecal samples will be evaluated for DAPA concentrations, and to identify forage species consumed.

Determine the nutrient content composition for 20-25 major shrub species present within the study area for the 2006-2008 winter time period.

Using the data obtained from objectives 1 and 2, combined with data on climatic conditions, and nutritional requirements of mule deer, a series of simulation models will be run to determine the adequacy of the Kaibab winter diets to meet the mule deer individual needs.

All analyses will be performed using state of the art methodologies and rigorous statistical designs.

PROJECT LOCATION:

The designated project area is the winter range habitat situated within the Kaibab National Forest. Specifically, the study area is designated as the area bounded by Snake Gulch on the North, Kanab Creek on the west, Kanab Creek and the Grand Canyon on the south, and FS roads 425,427, and 423 on the East. The 46,660 ha study is located in northern Coconino county, centered on coordinates 36º40" N Lat: 112º 25" W Long. [R 1W, T 37N]. All samples will be collected from this locale. Laboratory analysis will be conducted at ASU-East.

Two attached maps depict the project area with land ownership, and an example sampling grid over major habitat types.

LAND OWNERSHIP AT PROJECT SITE (Please state specifically if PRIVATE PROPERTY and provide landowner's name):

All lands are located within the USDA Kaibab National Forest. No privately owned lands are included.

IF PRIVATE PROPERTY, IS THERE A STEWARDSHIP AGREEMENT BETWEEN THE LANDOWNER AND THE DEPARTMENT? N/A

HABITAT DESCRIPTION:

The area is characterized as Great Basin Desertscrub at the lower elevation, graduating to Great Basin Conifer

Woodland Biome at the higher elevations. Dominate browse species include: big sagebrush (*Artemisia tridentata*), cliffrose (*Cowenia stansberiana*), service berry (*Amelanchier* spp.), Fendler's ceanothus (*Ceanothus fendleri*), birchleaf mountain mahogany (*Cercocarpus betuloides*), oak (*Quercus* spp.), and broom snakeweed (*Gutierrezia sarothrae*). Dominate tree species include: Ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), alligator juniper (*Juniperus depenaia*), and pinion pine (*Pinus edulis*). The major grass species include: western wheatgrass (*Elymus smithii*), crested wheatgrass (*Elymus cristatum*), cheatgrass (*Bromus tectorum*), and red brome (*B. rubens*).

. Elevation within the study area ranges from 2100 m along the southern boundary, to 1500 in the north. Historic weather patterns for the nearest weather station (Jacob Lake) record average snowfalls of 2.7 m with a mean snow depth of 7.6 cm and an annual precipitation of 52.6 cm. The mean annual high of 26.3C occurred in July with a mean annual low of -9.1 C in January.

ITEMIZED USE OF FUNDS:

Budget:

Budget (Annual) – 2 years of funding required

	ASU	**AZG&F**
Salaries		
PI		
10% (Ac Yr).	$7,400.00	
6 wk summers		$11,384.00
ere @ 25%	$1,850.00	$2,846.00
Graduate Assistant		
50% (An Yr.)		$22,000.00
ere @ 30%		$6,600.00
Hourly		
20 wks @ $8.00/hr		$6,400.00
ere @ 25%		$1,600.00
Subtotal	$9,250.00	$50,830.00
Materials & Supplies		
Chemicals & Analysis		$18,000.00
Subtotal		$18,000.00
Travel		
6 Trips @ $500.00/trip		$3,000.00
Subtotal		$3,000.00
Direct Cost	$9,250.00	$71,830.00
AZG&F Indirect Cost @ 10% of Direct Cost		$7,183.00

ASU Indirect Cost @ 49% of Direct Cost	$4,532.50	
ASU Indirect Cost @ 39% of AZG&F Direct Cost	$28,013.70	
Total Cost (Annual)	$41,796.20	$79,013.00
Total Cost for 2 Years	$83,592.40	$158,026.00
AGFD funds already committed		$30,000.00
Remaining funds needed		**$128,026.00**

LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:

FOR2 – assistance in field, external agency cooperation
USFS - member of work group
AGFD- oversees project
ADA - donation of funds, volunteer field assistance

PROJECT MONITORING PLAN:

The field and laboratory activities to be funded under this request will be carried out at ASU-East under the direction of Dr. Bill Miller. This is a sub-component of W-78-R Federal Aid research project being conducted by WMRS. Overall project management will be assured by the lead Biologist, Todd Atwood. Funds provided to ASU will be monitored under IGA #KR04-0850-EQS and specifically Amendment No. 1 to Task Order #4, which details number of samples, timing, analytical methods, deliverables and incremental payment schedule.

Additional monitoring will be accomplished by annual deer surveys, ground inspection surveys, and ultimately, hunter success records and comments.

PROJECT MAINTENANCE: N/A

PROJECT COMPLETION REPORT TO BE FILED BY:
Dr. William Miller, ASU-East

WATER DEVELOPMENT PROJECTS (see attached worksheet): N/A

TREE SHEARING (AGRA-AXE, PUSH) PROJECTS (see attached worksheet): N/A

PROJECT COMPLETION REPORT

(Please complete the report and forward to Game Branch
within 30 days of the completion of the project. THANK YOU!)

Project Title: Nutritional Status & Winter Range Carrying Capacity for Mule Deer on the N. Kaibab

Project number: _____

GMU: 12A

Project Coordinator (IF NOT APPLICANT): _____

Agency: AGFD/ WMRS

Address: _____

_____

Phone: _____

Email: _____

Project Completion Date Dec 2008

COOPERATING AGENCIES AND/OR CONSERVATION GROUPS, LANDOWNERS, ETC.:

PROJECT ACCOMPLISHMENTS:

PROJECT RESULT ACTIONS:

(List practices implemented as a result of project, i.e. area rested from grazing for 2 yrs., season recommendations revised based on new distributions, data received from project, etc.)

COMMENTS ABOUT THE PROJECT:
(Please list updates, reports, concerns, suggestions)

MAINTENANCE/MONITORING SCHEDULE (from this point on): WHO and WHEN?

PHOTO: (Please attach)

MAIL COMPLETED PROJECT COMPLETION FORM TO:
Game Branch
Arizona Game and Fish Department
2221 W. Greenway Road
Phoenix, AZ 85023
mdisney@azgfd.gov